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Jon Kyl, Chairman

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Reviewing the Progress of Missile Defense:

Exploring the Freedom Afforded the United States by the Absence of the ABM Treaty

- Executive Summary -

- December 13, 2003, marks the second anniversary of the United States' announcement that it would withdraw from the 1972 Anti-Ballistic Missile (ABM) Treaty in order to begin development of a missile defense system.

- With the ABM Treaty gone, the Bush Administration set a course toward an initial ground-based capability to be operational by 2004. Additional capabilities will be added in later years to create a "layered" missile defense system consisting of ground-, sea-, air-, and space-based components.

- The need for missile defense is becoming even clearer as the United States learns more about the actions of North Korea and Iran in developing weapons of mass destruction and pursuing longer-range ballistic missile capabilities.

- Reductions and restrictions in funding have resulted in delay of a robust layered missile defense system.

- While there has been progress toward the Administration's goal of an initial ground-based system by 2004, deployment of a layered missile defense system is still subject to delay well into the next decade if funding reductions and other limitations continue.

- Given the long-term objective of deploying a layered system, it is crucial that the Missile Defense Agency's future years' funding requests be met so that it can carry out research, development, testing, and evaluation of potential sea-, air-, and space-based systems to give the Administration clear options as it expands the initial ground-based system.

- A single architecture will not create as strong a deterrent to ballistic missile development as will a layered missile defense system. Multiple layers of missile defense will serve as an anti-proliferation measure by reducing the incentive to threaten the United States and its allies with a ballistic missile attack.

Introduction

> Today, as the events of September the 11th made all too clear, the greatest threats to [the United States and Russia] come not from each other, or other big powers in the world, but from terrorists who strike without warning, or rogue states who seek weapons of mass destruction.
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> We know that the terrorists, and some of those who support them, seek the ability to deliver death and destruction to our doorstep via missile. And we must have the freedom and the flexibility to develop effective defenses against those attacks. Defending the American people is my highest priority as Commander in Chief, and I cannot and will not allow the United States to remain in a treaty that prevents us from developing effective defenses.
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> *- President Bush, December 13, 2001*

On December 13, 2001, President Bush gave formal notice to Russia that the United States would withdraw from the 1972 Anti-Ballistic Missile (ABM) Treaty within six months. On June 13, 2002, the United States withdrew from the ABM Treaty; as a result, it was free to develop a missile defense system, an act banned under the bilateral Cold War agreement. The approaching second anniversary of the Bush Administration's announcement provides the opportunity to review the progress of missile-defense development thus far, as well as the direction of that development for the remainder of the decade.

Withdrawing from the ABM Treaty was the right decision, and it has been reinforced by recent discoveries regarding the nuclear weapons programs in North Korea and Iran, and the pursuit by those countries of longer-range ballistic missile capabilities. As the threat continues to grow, so does the urgent need to field a layered missile defense system able to counter the burgeoning ballistic missile capabilities of North Korea and Iran.

The ABM Treaty's termination freed the United States to begin development of a layered missile defense system that the ABM Treaty had prohibited, including the development, testing, and deployment of sea-based, air-based, space-based, and mobile land-based ABM systems, and ABM system components.

On December 17, 2002, President Bush directed the Department of Defense to field an initial ground-based interceptor capability in 2004.[1] The Missile Defense Agency (MDA) has chosen a "block approach," wherein additional capabilities will be added to the initial operational ground-based infrastructure in two-year incremental blocks (Block 2004, Block 2006, etc.). MDA has made laudable progress toward meeting the President's 2004 operational deadline.

As the United States moves forward, we should bear in mind the freedom afforded us by the demise of the ABM Treaty. Increased investment in aggressive ground-, sea-, and space-based missile defense research and development is necessary to field the layered system the

[1] Statement by President George W. Bush, December 17, 2002. See: http://www.whitehouse.gov/news/releases/2002/12/20021217.html.

Administration envisions. Continued development of allied cooperation is also an important goal for a layered missile defense. A robust, layered system will serve as a deterrent to countries or individuals intending to threaten the United States and our allies.

The Need for Deterrent

Background: Restrictions of the ABM Treaty vs. Layered Missile Defense

Under the ABM Treaty, which was in force from October 3, 1972, to June 13, 2002, the United States and the then-Soviet Union agreed

> …that each may have only two ABM deployment areas,[2] so restricted and so located that they cannot provide a nationwide ABM defense or become the basis for developing one. Each country thus leaves unchallenged the penetration capability of the others' retaliatory missile forces…Further, to decrease the pressures of technological change and its unsettling impact on the strategic balance, both sides agree to prohibit development, testing, or deployment of sea-based, air-based, or space-based ABM systems and their components, along with mobile land-based ABM systems.[3]

Several of the advances already made by MDA would have been banned or severely restricted under this Treaty, including development of a ground-based missile defense capable of defending more than one location; sea-based missile defense development; advanced sensors; space-based sensor development; and allied cooperation.

Nor would a layered missile defense system, the eventual goal of U.S. missile defense, have been possible. A layered system uses integrated individual missile defense systems to target and destroy an incoming ballistic missile during the three phases of its flight: boost, midcourse, and terminal. Attacking the ballistic missile in all phases of its flight increases the number of opportunities to shoot down the incoming missile and warhead.

Development of missile defense capabilities varies, depending on the phases of ballistic missile flight targeted. MDA's main development efforts are focused on midcourse defense primarily through a ground-based architecture.[4] Boost-phase defense will rely heavily on sea-based capability and the airborne laser (ABL) over the next several years, but it could one day be handled by space-based components.[5] Terminal defense that can counter an inter-continental ballistic missile (ICBM) is not currently under development by MDA.[6]

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[2] Reduced to one area by the subsequent "Protocol to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems" (July 3, 1974).

[3] "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems" (May 26, 1972).

[4] The midcourse phase of an inter-continental ballistic missile's flight path begins when the missile ceases to accelerate under its own thrust and ends when the warhead reenters the Earth's atmosphere. Targeting a missile during this stage benefits from the length of time available to discern the proper target. However, the weakness of midcourse defense is the extended length of time during which an enemy can deploy countermeasures against the interceptor. A basic sea-based midcourse system may be operational by 2005-2006 with upgrades in subsequent years. A sea-based midcourse system would target a missile as it enters midcourse flight, complimenting a ground-based midcourse system, and also reducing the time in which an incoming missile can deploy countermeasures.

[5] The boost phase is the period of a missile's flight path from launch until it ceases acceleration under its own power. The benefits of targeting a missile during boost phase include the relative slow speed of the missile, and the limited number of countermeasures that can be deployed at this point. A challenge to boost-phase defense is due to the

Escalating Ballistic Missile Threat

The need for missile defense is becoming even clearer as the United States learns more about the efforts of North Korea and Iran to develop weapons of mass destruction and pursue longer-range ballistic missile capabilities.

The April 2003 disclosure by North Korea that it possessed nuclear weapons demonstrates that traditional arms control agreements do not curb the threat posed by a totalitarian regime set on developing deliverable weapons of mass destruction (WMD). The CIA estimated that North Korea could produce a uranium-based atomic weapon by the second half of 2004.[7]

The danger of North Korean development of nuclear weapons is exacerbated by its continued pursuit of ICBMs. A recently released CIA report on foreign acquisition of WMD and advanced conventional weapons states: "The multiple-stage Taepo Dong-2—capable of reaching parts of the United States with a nuclear weapon-sized payload—may be ready for flight-testing."[8]

The threat from North Korean ballistic missiles is not confined to the Pacific Rim. The CIA report continues:

> North Korea is nearly self-sufficient in developing and producing ballistic missiles, and has demonstrated a willingness to sell complete systems and components that have enabled other states to acquire longer range capabilities earlier than would otherwise have been possible and to acquire the basis for domestic development efforts.[9]

The Iranian regime has been one of the beneficiaries of North Korea's willingness to proliferate. Despite Iran's announcement that it will submit to International Atomic Energy Agency (IAEA) inspections, Secretary of State Colin Powell said recently that the IAEA "has found conclusively that Iran is pursuing a clandestine program to produce fissile material that could be used to build nuclear weapons."[10] U.S. allies and U.S. interests in the Middle East would be particularly threatened by a nuclear Iran, as are our European allies if Iran can expand the range of its Shahab ballistic missiles.

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limited time available (3-5 minutes) to discern whether a launch is hostile. Other challenges to boost-phase defense include geographic and speed limitations of the interceptor. The ABL and sea-based interceptors will be the first boost-phase defense against long-range threats; they are not likely to be operational until at least Block 2008. Demonstrations of a space-based boost-phase defense test bed are not expected until Block 2010 at the earliest.

[6] The terminal phase begins when the warhead reenters the Earth's atmosphere, and lasts until it reaches its target or is destroyed. MDA is studying the feasibility of creating an interceptor that could counter an ICBM. A Long Range Atmospheric Defense (LRAD) system would likely be an upgrade of the Theater High Altitude Area Defense (THAAD), which is a system designed for force protection from medium- and small-range threats. See: Mark Selinger, "MDA Studying Terminal-Phase System for Long-Range Missiles," *Aerospace Daily,* November 20, 2003.

[7] Thomas Omestad, "The Art of the Deal," *U.S. News and World Report*, September 1, 2003, p. 21.

[8] Central Intelligence Agency, *Attachment A. Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January through 30 June 2003*. Posted November 10, 2003. Accessed at: http://www.cia.gov/cia/reports/721_reports/jan_jun2003.htm p. 4.

[9] CIA, *Attachment A,* p. 4.

[10] Secretary of State Colin L. Powell, "Remarks at U.S.-Arab Economic Forum," Detroit, September 29, 2003. Accessed at: http://www.state.gov/secretary/rm/2003/24684.htm.

The CIA foreign acquisition report noted that "Iran publicly acknowledged the development of follow-on versions of the Shahab-3. It originally said that another version, the Shahab-4, was a more capable ballistic missile than its predecessor but later characterized it as solely a space launch vehicle with no military applications. Iran is also pursuing longer-range ballistic missiles."[11] A longer range version of the Shahab-3 would have inherent military applications despite Iran's claims. Iran's pursuit of longer-range ballistic missiles with support from North Korea remains particularly troubling.[12]

While the most immediate missile threat stems from North Korea and Iran, a number of countries have pursued activities of concern, such as proliferation of ballistic missile technology. Of particular concern is the continued proliferation of ballistic missile-related technology by Russia and China.[13]

Investment Needed for Tomorrow as Well as Today

While missile defense development has progressed, deployment of a layered missile defense system is still subject to delay well into the next decade. Opponents to missile defense have already created such delays by seeing to it that funding is restricted. Future reduction or restriction of funding for missile defense will hamper the ability of MDA to continue research that augments a ground-based, midcourse defense system.[14]

Past Funding Reductions and Restrictions

MDA must balance the two complementary goals of fielding a preliminary system in the short term, while conducting the necessary research and development that will indicate what form an overall system will take in future years. Funding reductions and restrictions since FY02 already have resulted in delays of a layered missile defense system.

FY04 was the first year that the President's overall funding request for missile defense was met.[15] The FY04 Department of Defense Appropriations Act approved $9.1 billion for missile defense programs.[16] In FY03, missile defense research and development was reduced by $80

[11] CIA, *Attachment A*, p. 3. The Shahab-3 is believed to have a range of approximately 1,300 km and it is estimated a potential Shahab-4 may achieve a range of 2,000 km, according to *Jane's Information Group*.

[12] On August 5, 2003, the Japanese newspaper *Sankei Shimbun* reported that North Korea is in talks with Iran to send it Taepo Dong-2 long-range ballistic missiles and to jointly develop nuclear warheads with Tehran. The newspaper reported that North Korea planned to export components to Iran and would then assemble the Taepo Dongs at an Iranian factory.

[13] CIA, *Attachment A*, ps. 8-11.

[14] Funding for MDA is separated into distinct program elements (PE) under the annual defense appropriations bill (10 U.S.C. 223). The PE functional areas include: technology; ballistic missile defense system; terminal defense segment; midcourse defense segment; boost defense segment; and sensors segment. Although funding for an entire operational sea- or space-based component is not included in a single PE, crucial funding for research, development, testing, and evaluation (RDT&E) is spread out through the various PEs. A major reduction in one PE can cause research and development for other components of a layered system to be delayed until future years.

[15] In FY01, funding for MDA's precursor organization, the Ballistic Missile Defense Organization (BMDO), received an increase of $319.1 million over the Clinton Administration's request of $4.49 billion.

[16] The budget request for FY04 MDA RDT&E was $7.73 billion, but did not include funding for PAC-3/MEADS, which was transferred to the Army, consistent with the President's request. Notable reductions in the FY04 DoD Appropriations Act include $182 million less than the President's request for the Ballistic Missile Defense System

million. In FY02, the ballistic missile defense request was reduced by $530 million, primarily in cuts to sea-based terminal defense and the Space-Based Infrared System (SBIRS) Low program (now known as the Space Tracking and Surveillance System or STSS).[17] Continued development of STSS is crucial for a layered missile defense system because STSS will provide the necessary information to track incoming missiles throughout their flight and will discriminate between warheads and decoys.[18]

Another challenge to the goal of a layered system resulted from restrictive language included in the FY03 defense authorization bill. That bill required the Administration to determine if $814.3 million requested for missile defense should be used for combating terrorism or for ballistic missile programs, depending on "whichever the President determines to be in the national security interests of the United States."[19] While the Administration opted to use the funding for missile defense, such language had the potential to reduce funding and delay research and development for several years, and may have been included to enable missile defense opponents to claim the President was less concerned about terrorism than some future ICBM threat.

Funding for today should not come at the expense of tomorrow's successes. While it is imperative to complete the initial goal of fielding an operational system, Congress and the Administration must also continue to focus on the research and development necessary to achieve a layered system.

For example, to properly field an initial ground-based midcourse system by 2004, funding was drawn from the budget request for interceptor research and development. The Administration's request for interceptors was reduced to $119 million from the original request of $301 million in the defense appropriations bill. The MDA request for $301 million included $61.6 million for research into a space-based system that, unfortunately, now will have to be delayed to future years.[20]

Future Funding

Full funding of the Administration's request for Block 2006 through Block 2010 will be necessary to achieve a layered missile defense system by the end of Block 2010.

The Administration recognizes that missile defense should not be bound to a single architecture. This approach reduces the risk of failure of any single phase of missile defense. Adjustments in funding are to be expected due to the technical hurdles still facing MDA in the

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Interceptor program element, and a reduction of $15.5 million from the Space Tracking and Surveillance System (STSS), formerly known as Space-Based Infrared System (SBIRS) Low.

[17] For missile defense funding levels see: Steven A. Hildreth, "Missile Defense: The Current Debate," *Congressional Research Service*, Report No. RL31111, October 28, 2003.

[18] According to Marcia S. Smith, "Military Space Programs: Issues Concerning DOD's SBIRS and STSS Programs," *Congressional Research* Service, Report No. RS21148, December 3, 2003, "The goal of an operational STSS is to track missiles through all three phases; discriminate between warheads and decoys; transmit data to other systems that will be used to cue radars and provide intercept handovers; and provide data for intercept hit/kill assessments."

[19] Conference Report 108-772 to accompany H.R. 4546, the National Defense Authorization Act for FY03, p. 687.

[20] The request included $47.6 million for a crucial "near-field infra-red experiment," and $14 million for a space-based test bed.

near term. In fact, Congress provided an important tool to MDA by allowing research and development funds to be used for the fielding of an operational missile defense system.[21] However, reduction or restriction of the Administration's total funding request for MDA would delay the development of such components as additional sea- and space-based sensors, and sea- and space-based interceptors.

Given the long-term objective of developing and deploying a layered system, combined with the growing missile threat, it is crucial that future years' overall funding requests for MDA be met. Once an initial ground-based midcourse defense is operational, particular emphasis should be placed on funding for research, development, testing, and evaluation (RDT&E) for sea- and space-based missile defense. Increased RDT&E funding no later than Block 2006 will ensure that remaining technical questions will be addressed. Doing so will present the Administration with clear options when it is time to field more robust components to enhance the initial ground-based midcourse system to be fielded in 2004.

Allied Cooperation and Layered Missile Defense

Close cooperation with U.S. allies will be useful to the United States to achieve an effective layered missile defense. While the United States could field a system on its own, cooperation of certain allies could guarantee that key components, such as radar locations and interceptor basing locations, are not lost.

Missile defense cooperation was expressly prohibited by Article IX of the ABM Treaty. Post-treaty, there have been important cooperative efforts with U.S. allies, spanning a wide range of activities. Briefly reviewing a number of the joint projects reveals the extent to which a layered system relies on cooperation, ranging from foreign-based sensors to development of individual systems.

The U.S. missile defense system has benefited in particular from the U.S.-U.K. memorandum of understanding on the Fylingdales early warning radar (EWR) site, which will allow the United States to upgrade and use the EWR site. Boeing will spend $111.7 million on the upgrades, which will enable the site to track and identify incoming threats in addition to serving simply as an early warning radar.

One of the most effective partnerships has been between the United States and Israel. The two countries have worked on the development of the Arrow Weapon System (AWS), which achieved initial operational capability in October 2000. On December 19, 2002, the MDA - in response to Congressional direction - and the Israeli Ministry of Defense (IMOD) entered into an agreement to establish a capability in the United States to co-produce specified Arrow interceptor missile components.[22]

[21] See: Sec. 223 of P.L. 108-136, the National Defense Authorization Act for Fiscal Year 2004.
[22] In March 2001, both nations implemented the Arrow System Improvement Program (ASIP) to provide the AWS an enhanced capability to defend against the longer-range ballistic missile threats. U.S.-Israeli cooperation on AWS will assist Israel to meet its defense requirements more quickly and maintain U.S. industrial work share.

In addition, Japan has recognized the threat posed to its homeland by North Korean ballistic missile development. MDA has established an integrated international support team to work on missile defense cooperation with Japan. Furthermore, since August 1999, Japan and the United States have worked on a joint research project to design and develop four advanced components for the Standard Missile interceptor (SM-3).

The joint U.S.-German-Italian Medium Extended Air Defense System (MEADS) is a terminal defense system for force protection. MEADS will use the Patriot PAC-3 missiles to provide a mobile system with 360-degree radar coverage to protect troops from short- and medium-range ballistic missile threats. The cooperative venture is a risk-reduction measure, initiated in July 2001, to conduct a proof of principle demonstration of a MEADS prototype. In the long term, MEADS is envisioned as a replacement for the Patriot PAC-3 system.

One of the best ways to deepen allied cooperation is to award further contracts to companies in allied countries. The development of components by foreign firms would offer several benefits. It would present an alternative if domestic development is hampered; it would increase support for missile defense abroad as jobs are created in the foreign country's development facility; and it would tap into technological expertise in allied countries.

Conclusion

As we approach the second anniversary of the Bush Administration's announcement of its intention to withdraw from the ABM Treaty, it is important to appreciate the progress the United States has made in missile defense development, and to consider how the United States may continue to take advantage of the freedom afforded it by the absence of the ABM Treaty.

U.S. withdrawal from the treaty has allowed the United States to make significant progress toward building an initial ground-based midcourse missile defense capability; however, the Administration has correctly directed the United States toward development of a layered missile defense system, not bound by a single architecture.

A single architecture likely will not deter rogue states from ballistic missile development or proliferation. Multiple layers of missile defense - reinforced by additional allied capability - will serve as an anti-proliferation measure: as U.S. vulnerability to ballistic missiles is reduced, so will the incentive for rogue states to produce them.

Given today's threat and the long-term objective of developing and deploying a layered system, it is crucial that future-year funding requests for MDA be met. Investment now will ensure that remaining technical questions can be addressed, providing the Administration with clear options when it is time to field a more robust system that can deter countries or groups intending to threaten the United States or its allies.